

Clinical Profile of Patients with Migraine Headache Presenting to Otolaryngology Department at A Tertiary Care Hospital in Mandya: A Cross-Sectional Study

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ABSTRACT

Background: Migraine is a common headache disorder often characterized by head pain and associated neurological symptoms. It is frequently misdiagnosed as a sinus headache due to overlapping symptoms and a lack of clear diagnostic criteria. Migraine symptoms can extend beyond headaches, including facial pressure, nasal congestion, ear pain, tinnitus, and dizziness, often misattributed to ear or sinus disease.

Methods: A Cross-sectional study among 145 patients was conducted at a tertiary care hospital at Mandya over 6 months to evaluate the clinical profile of migraine patients presenting to the Otorhinolaryngology department. A total of 145 Patients in the study group were diagnosed positive for migraine as per the International Headache Society (IHS) criteria of migraine, and then symptoms were evaluated. Ear and nasal pathologies were ruled out by pure tone audiometry, tympanometry, nasal endoscopy and CT scan of the nose & paranasal sinuses.

Results: The study found that 55.2% of migraine patients were aged between 18-30 years, with no significant age-related difference in presentation. The majority (75.9%) had migraines without aura, followed by 19.3% with aura and 4.8% with definite migrainous vertigo (DMV). The most frequent symptoms were headache (32.4%), ear fullness (24.8%), and nasal obstruction (17.2%). These findings highlight both typical and atypical migraine presentations.

Conclusion: This study concluded that migraine patients can also have atypical presentations like ear and nasal complaints apart from typical complaints of headache & vertigo, which may lead them to consult an Otorhinolaryngologist in any phase of presentation.

Key-words: Otolaryngology, International Headache Society (IHS), Pure tone audiometry, Tympanometry, Nasal endoscopy

INTRODUCTION

Migraine is a common primary headache disorder.^[1] Migraine is classically defined by the quality of head pain and the presence of associated neurologic symptoms.^[2] Due to the variability in its clinical presentation, half of the patients with migraine are undiagnosed.^[1]

Through various mechanisms, migraines can cause or modify symptoms anywhere in the body, predominantly in the head and neck.^[3] Headache and dizziness are typical migraine manifestations in the head and neck area that are defined by clinical criteria (the International Headache Society, IHS for headache and Neuhauser's for migrainous vertigo)^[2]

Sinus headache is the most frequent and common erroneous diagnosis given to patients with migraine. This confusion is due to the lack of operational diagnostic criteria and the scarcity of nosologic research to define the distinguishing clinical features of the headache associated with rhino-sinus pathology. The IHS does not recognise sinus headaches as a diagnostic entity unless

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associated with underlying acute rhino-sinusitis. Even a headache associated with an underlying sinus infection is poorly characterized.^[3]

We know nowadays that migraine patients can also present with a multitude of other head and neck symptoms. These can happen outside of the headache attack but are still believed to result from the same pathophysiologic migraine mechanisms. These atypical head and neck presentations of migraine are essentially related to the nose and the ear. The main non-headache rhinologic symptoms include the following: facial and sinus pressure/fullness, frequently called “sinus-headache,” nasal congestion, and less regularly runny nose. The main non-dizziness ear symptoms include the following: ear fullness and pressure, ear pain, sound intolerance, and tinnitus. Most patients with these symptoms present to the otolaryngologist, who, if not experienced enough with the migraine symptoms, can easily miss the diagnosis and attribute those symptoms to primary ear or sinus disease without strong clinical evidence.^[1]

Migraine is a syndrome of hyperactivity of the trigeminal nerve by releasing inflammatory neuropeptides from trigeminal fibres on blood vessels. This sensitizes them to pulsations and causes mild to severe pain in areas of trigeminal innervations (intracranial sites, sinuses, inner ear). The migraine Pain experienced may be frontal if the ophthalmic branch (V1) is the affected nerve or maxillary if the maxillary branch (V2) is involved in patients presenting with facial pain. Vestibular migraine can present with vertigo or dizziness as chief complaints. When there is no primary labyrinthine disease (Benign Paroxysmal Positional Vertigo BPPV), neuronitis, Meniere’s disease and headache present, vestibular migraine is likely. There is growing evidence which supports the relationship between migraine and sudden sensorineural hearing loss, tinnitus and otalgia^[4,5].

MATERIALS AND METHODS

Research Design- This cross-sectional study was conducted in the Department of Otorhinolaryngology at Mandya Institute of Medical Sciences (MIMS), Mandya, over six months after receiving approval from the Institutional Ethics Committee (IEC). The study population included patients presenting to the Otorhinolaryngology Outpatient Department at MIMS. The sample size was calculated by using a formula. Based

on one of the previous studies, the prevalence of migraine was found to be 10.8% of the patients presenting to the ENT clinic with migraine diagnosis.^[1]

$$\text{Sample size (N)} = Z^2 \times p \times q / e^2$$

where Z= Standard Normal Variant (1.96)

p= Prevalence of migraine

q= (100-10.8) =89.2, Absolute error, e = (5)

$$\text{So, N} = (1.96)^2 \times 10.8 \times (100-10.8) / (5)^2 = 148$$

The sample size is 145, according to the calculation.

Methodology- Data collection began after IEC approval and included the chief complaint, duration, age, and gender of the patients. Participants were aged 18 years and older and presented to the ENT department with symptoms typical of migraine, diagnosed using the International Headache Society (IHS) criteria, which include migraine with aura (IHS 1.1) and migraine without aura (IHS 1.2). Dizziness was diagnosed as migrainous if the patient met Neuhauser’s criteria for DMV. Atypical otologic and rhinologic migraine symptoms were diagnosed based on individualized clinical criteria, where the presence of at least one of the following was required: symptoms concomitant with an IHS migraine headache, symptoms concomitant with Neuhauser’s definite migrainous vertigo or a response to migraine preventive treatment, alongside the ruling out of other primary or secondary causes. For ear fullness, pressure, and tinnitus, pure tone audiometry and tympanometry were performed, and only expected results were included in the migraine diagnosis group. For ear pain, tympanometry and upper airway endoscopy were used to exclude other causes of pain. For rhinologic symptoms, the absence of purulent discharge on endoscopy and sinus opacification on imaging were considered for diagnosis.

Inclusion Criteria

- Patient of both sexes of more than 18 years of age fulfilling the International Headache Society (IHS) criteria for migraine.
- Patient of both sexes of more than 18 years of age fulfilling the Neuhauser criteria for definite migrainous vertigo.

Exclusion Criteria

- Patients with psychiatric co-morbidities, pregnant and lactating women
- Patients diagnosed with brain tumours, Cerebrovascular accident (CVA), hypertension and rhino sinusitis.

Statistical Analysis- Data was entered in an MS Excel spreadsheet, and descriptive analysis, such as proportion, mean, standard deviation, etc. was used. Statistical tests to detect significant differences or associations, such as the T and chi-square tests, were used and analyzed using SPSS trial version-22 software.

RESULTS

Of 145 patients, 74 (51%) were female, and 71 (49%) were male. The study showed no significant gender difference in the occurrence of migraines, with a nearly equal male-to-female ratio ($p=0.37$) (Table 1).

Table 1: Sex distribution among the study population

Sex	No of patients	Percentage (%)
Female	74	51
Male	71	49
Total	145	100

Most patients (80, or 55.2%) were aged between 18 and 30, while 65 (44.8%) were above 30. The mean age was 31 ± 8.8 years, with no significant age-related difference in migraine presentation ($p=0.33$) (Table 2).

Table 2: Age group distribution among the study population

Age group	No of patients	Percentage
18-30 Years	80	55.2
>30 Years	65	44.8
Total	145	100

Of the 145 migraine patients, 110 (75.9%) had migraines without aura, 28 (19.3%) had migraines with aura, and 7 (4.8%) met the criteria for DMV. This indicates that migraine without aura is the most prevalent form (Table 3).

Fig. 1 shows that 75.9% of the patients had migraines without aura, 19.3% with aura, and 4.8% had DMV. The

graphical representation supports the data from Table 3, showing a predominance of migraine without aura.

Table 3: Migraine distribution among the study population

Migraine positive	No of patients	Percentage
Without aura	110	75.9
With aura	28	19.3
DMV	7	4.8
Total	145	100

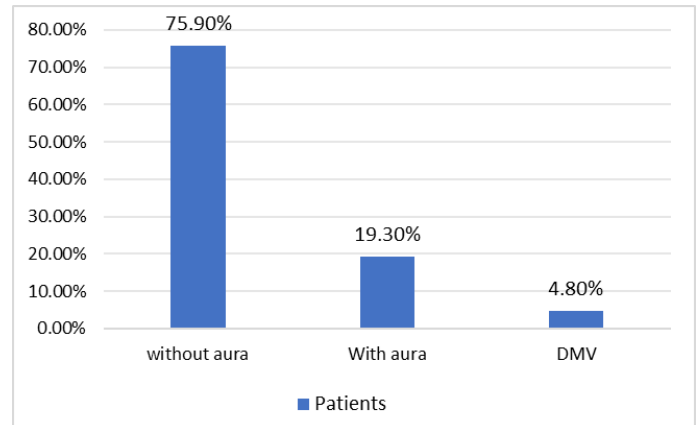


Fig. 1: Migraine distribution among the study population

The most common symptom was headache, affecting 47 (32.4%) patients, followed by ear fullness (24.8%), nasal obstruction (17.2%), and earache (9.7%). Less common symptoms included tinnitus (2.1%), nasal discharge (5.5%), and vertigo (4.1%) (Table 4).

Table 4: Presenting symptom distribution among the study population

Valid	F	P	VP	CP
Decreased hearing	2	1.4	1.4	1.4
Ear ache	14	9.7	9.7	11.0
Ear itching	1	.70	.70	11.7
Ear fullness	36	24.8	24.8	36.6
Headache	47	32.4	32.4	69.0
Nasal discharge	8	5.5	5.5	74.5
Nasal itching	3	2.1	2.1	76.6
Nasal obstruction	25	17.2	17.2	93.8
Tinnitus	3	2.1	2.1	95.9
Vertigo	6	4.1	4.1	100
Total	145	100	100	

F= Frequency, P= Percent, VP= Valid Percent, CP= Cumulative Percent

Fig. 2 shows the frequency of various symptoms, with headache being the most prevalent (32.4%), followed by ear fullness (24.8%) and nasal obstruction (17.2%). The

distribution aligns with the findings in Table 4, emphasizing typical and atypical migraine symptoms.

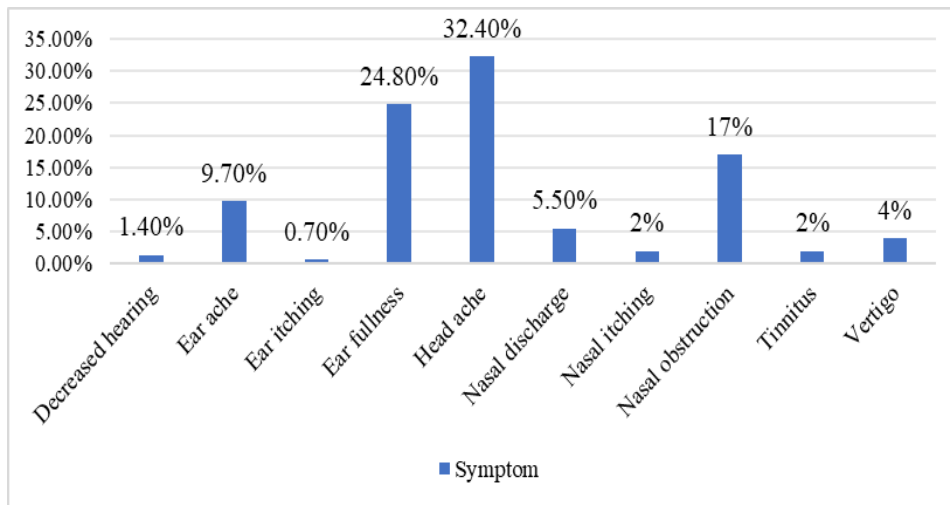


Fig. 2: Presenting symptom distribution among the study population

Among the 145 patients who met migraine criteria, the majority 47(32.4%) patients, presented with migranous headache (normal CT nose & paranasal sinuses) and 6(4%) patients presented with DMV. The atypical presentation includes mainly ear complaints [ear

fullness 36 (24.8%), ear ache 14(9.7%), tinnitus 3(2.1%), decreased hearing 2(1.4%), ear itching 1(0.7%)] and nasal complaints [nasal obstruction 25(17.2%), nasal discharge 8(5.5%), nasal itching 3(2.1%)] (Table 5).

Table 5: Presenting symptoms of migraine

Presenting symptom	Migraine positive			Total
	Dmv	With aura	Without aura	
decreased hearing	0	2	0	2
ear ache	0	3	11	14
ear fullness	0	0	1	1
Ear fullness	0	7	29	36
headache	1	11	35	47
nasal discharge	0	1	7	8
nasal itching	0	1	2	3
Nasal obstruction	0	3	22	25
tinnitus	0	0	3	3
vertigo	6	0	0	6
Total	7	28	110	145

From presenting symptoms of patients who met migraine-positive criteria (migraine without aura, with aura and DMV group), it was found to be significant

($p=.000$) that patients can present with both typical (migraine headache, migranous vertigo) and atypical symptoms (ear and nose complaints) (Table 6).

Table 6: Chi-square test in patients with migraine (without aura, with aura, DMV)

	Value	df	p-value
Pearson Chi-Square	135.199 ^a	18	.00
Likelihood Ratio	56.806	18	.00
N of Valid Cases	145	-	-

DISCUSSION

Although migraine is a significant risk factor for various otorhinolaryngological entities, less consideration was given to the diagnosis [6]. Atypical presentations of migraine in the form of ear fullness and vertigo can get initially confused with BPPV and Eustachian tube dysfunction. Relevant history and proper investigations will help in the early diagnosis of migraine and migrainous vertigo [7].

In our study majority of patients presented with migranous headaches compared with other atypical ear and nose complaints (ear fullness, ear ache, tinnitus, nasal obstruction and nasal discharge). Among the study population, the female-to-male ratio was 74/71, and no significant sex difference ($p=0.37$) was noted in migraines without aura, with aura and DMV groups. No significant difference was noted among the age group of migraine patients ($p= 0.33$). In our study, 75.9% of patients had migraines without aura, and 19.3% had migraines with aura. You can compare this with findings from the Sabra *et al.* [1] study, which found a higher incidence of migraine headaches without a specific focus on the aura. Discuss any similarities or deviations in prevalence, and suggest possible reasons (e.g. population differences, diagnostic criteria). A similar descriptive study conducted by Sabra *et al.* [1] in the Department of Otolaryngology, Saad Specialist Hospital, and Clinical Research Laboratory, Saad Research and Development Centre, Saad Specialist Hospital, Saudi Arabia, over the 6 months showed among 1002 patients presented with ENT chief complaints, 108 patients met one of the diagnostic categories for “migrainous chief complaint”. In the “migrainous chief complaint” group of patients, 76 females and 32 males had chief complaints of headaches. This headache history was tension-type in 8 patients and was migraine in 100 patients 894 patients presented with “non-migrainous chief complaint” [1,8-11].

Overall, in the whole group, the female-to-male ratio (F/M) was found to be 441 female/561 male patients. A cross-sectional study conducted by Schulz *et al.* [2] at the Division of Head and Neck Surgery and Communication Sciences, Duke University Medical Centre, Durham, North Carolina, USA, Department of Otolaryngology, George Washington University, Washington, DC, USA from June 2015 and March 2017 using MAT (Migraine Assessment Tool) score showed that out of the 1458 patients screened, 235 (16.1%) were MAT+. The MAT+ cohort was significantly younger than the MAT– group (47.2 vs. 55.6 years, $p<.001$). The MAT+ group had a higher proportion of women than the MAT–group (80.0% vs. 55.9%, $p<.001$), but no significant female preponderance was noted in our study. Our study showed an almost equal male-to-female ratio with no significant sex difference ($p=0.37$) [11]. In contrast, Schulz *et al.* [6] reported a significantly higher female prevalence (80% vs. 55.9%). You could explore why your study did not find this female preponderance, potentially discussing cultural or regional differences in healthcare-seeking behaviour or sample size considerations. Like our study, the majority of patients had migrainous headaches here; also, 81.3% suffered from migraine headaches. A large portion of the MAT+ population in this study complained of aural pressure (61.9%) and/or tinnitus (70.5%) and 85% of patients in the MAT+ cohort experienced facial pressure, with the majority citing the sensation behind their eyes (71.9%), forehead (55.7%) but also across both cheeks (33.9%) and within a unilateral cheek (15.8%). 49.9% of the patients who screened for MAT1 reported rhinorrhea [6,12]. A cross-sectional study was done by Shrestha *et al.* [7] from October 22, 2021, to February 20, 2022, based on a self-administered questionnaire among the undergraduate medical students of Kathmandu Valley. Students from a total of six medical colleges (College of Medicine, Nepalese Army Institute of Health Sciences, Kathmandu, Nepal presenting to the Department of Critical Care, Karnali Academy of Health Sciences, Jumla, Nepal, Department of Physiology, Nepalese Army Institute of Health Sciences, Kathmandu, Nepal, Department of Internal Medicine, Mount Sinai Hospital, Chicago, Illinois, USA with participants of age ranging from 17 to 28 was done [13,14]. Out of 361 students, a total of 352 individuals who responded were part of this study, and among them, 229 (65.1%) were males and



123 (34.9%) were females. 15.3% (95% confidence interval (CI): 11.7%-19.3%)^[7]. A prospective study conducted by Ahmed *et al.*^[8] among 120 patients with headaches approaching an otorhinolaryngologist in the department of ENT and Head Neck Surgery, BBMH, USTC, Foy's Lake Chittagong from June 2006-June 2007 in the age group of 11-60 years showed that 47 (39.16%) patients presented with migraine headache, maximum in the age group of 21-30 years (39.16%) and male to female ratio was 1: 2.5^[8] whereas in our study no notable difference was found between the age group, sex and migraine positive^[15].

CONCLUSIONS

The higher number of otolaryngology patients with migraines who complain of ear fullness, ear ache, tinnitus, nasal obstruction, and rhinorrhea will initially make this neurologic condition diagnosis and treatment challenging. It may explain antibiotic's high failure rate (80%-84%) in relieving rhino sinusitis. Practitioners should routinely consider exploring possible symptoms of migraine. This observation suggests a significant opportunity for otolaryngologists to improve their understanding of a relatively common yet uncommonly diagnosed condition, migraine. A better understanding of the possible presentations of migraine, which can mimic many head and neck complaints presenting to Otorhinolaryngology, may help the identification of patients with migraine disease and improve treatment planning. Including the study of migraines in otolaryngology residency programs and encouraging more clinical and basic science migraine research within our speciality will aid in improving the burden of migraine headaches in day-to-day life.

CONTRIBUTION OF AUTHORS

Research concept- Ravi D, Vijay P, Harsha K

Research design- Vijay P, Harsha K

Supervision- Ravi D

Materials- Vijay P, Harsha K

Data collection- Vijay P, Harsha K

Data analysis and Interpretation- Ravi D

Literature search- Vijay P, Harsha K

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Critical review- Ravi D

Article editing- Vijay P, Harsha K

Final approval- Ravi D

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